

# BRE Test Report

## Tests to PAS 59:2014 on Forest Safety Products 600mm Lorry Fall Arrest Bags

Prepared for: Julie Boon, Managing Director, Forest Safety Products Limited  
Date: 10<sup>th</sup> April 2015  
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Date 10<sup>th</sup> April 2015

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## Summary of test results

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# PAS 59:2014 Drop Test

## Result of tests carried out according to PAS 59:2014

|  |  |
|--|--|
| <b>Bag Tested:</b> 600mm Forest Safety Products Lorry Fall Arrest Bags                             |  |
| <b>Dimensions:</b> 1800mm x 2400mm x 600mm   |  |
| <b>Configuration:</b> Single 600mm Lorry bag. Overall depth 600mm.                                 |  |
| <b>Client:</b> Forest Safety Products Ltd  |  |
| <b>Date of test:</b> 7 <sup>th</sup> April 2015  | <b>Report Number:</b> PR1038-1001        |
| <b>Report Prepared by:</b> Dr P Blackmore – Associate Director, Building Technology Group          |  |
| <b>Signed:</b>  | <b>Date:</b> 10 <sup>th</sup> April 2015 |
| <b>Approved on behalf of BRE by :</b> Dr J Bregulla – Director, Building Technology Group          |  |
| <b>Signed:</b>  | <b>Date:</b> 10 <sup>th</sup> April 2015 |
| <b>Results</b>   |  |
| <b>Drop test 1 - Drop height 2.0m:</b> Maximum deceleration – 10.92g                               |  |
| <b>Drop test 2 - Drop height 2.0m:</b> Maximum deceleration – 11.65g                               |  |
| <b>Drop test 3 - Drop height 2.0m:</b> Maximum deceleration – 13.26g                               |  |
| <b>Overall Result: PASS at drop height of 2.0m</b>   |  |



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## 1 Introduction

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This report describes testing of Forest Safety Products 600mm Lorry fall arrest bags to the requirements of PAS 59:2014 incorporating corrigendum No 1, here after referred to as PAS 59:2014 [1]. This work is based on BRE proposal number 137-383 dated 24<sup>th</sup> February 2015, which was accepted by Ms Jo Summers of Forest Safety Products Ltd, Stardens Works, Tewkesbury Road, Newent, GL18 1LG.

The tests were carried out under the BRE Standard Terms and Conditions of Business for testing as BRE project number PR1038.



## 2 Description of Test Specimens

The bag tested was supplied by Forest Safety Products Ltd. This bag comprise of an outer woven polypropylene fabric, sealed with a continuous stitched seam and filled with filler type REPS (Recycled Expanded Polystyrene) encapsulated in polythene bags.

The bag tested was a Forest Safety Products 600mm Lorry Fall Arrest Bag with nominal dimensions of 1800mm x 2400mm x 600mm deep. The bag was laid on a concrete floor for these tests as shown in Figure 1.



Figure 1 View of the 600mm Lorry bag

### 3 Details of the Tests Carried Out

The tests were carried out according to PAS 59:2014 Annex A which specifies the requirements for filled collective fall arrest systems used to absorb kinetic energy of a falling person from a height. The deceleration was measured using a calibrated tri-axial accelerometer. The resultant vector sum vertical axis deceleration results were used and are presented in this report. The sample rate for the deceleration measurements was 1024Hz. The raw deceleration signal was filtered at 60Hz using a Fast Fourier Transform Digital Filter.

The bag was positioned on a rigid concrete floor as shown in Figure 1. A mass was allowed to free fall from a height of 2.0m (measured above the highest point of the bag) onto the bag.

The mass used for these tests was a rigid steel cylindrical block of diameter 200mm conforming to the specifications of BS EN 364:1993. An accelerometer was rigidly attached to the top face to measure maximum deceleration force. A disc of plywood simulating the floor area of an EU male boot size 42/43 ( $280 \pm 5$ ) mm diameter and ( $20 \pm 5$ ) mm thick was secured to the underside of the steel mass, as required by BS EN 364.

The deceleration generated during the impact was measured by the accelerometer attached to the top of the mass. A time/acceleration curve was recorded for each impact from which the maximum deceleration was identified. Figure 2 shows the drop positions used in this test



Figure 2 Impact positions used in this test



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## 4 Results

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The maximum deceleration measured for each drop is given in Table 1. Annex A shows the time-deceleration curves measured during the testing.

Table 1 Summary of test results for 600mm Lorry bag

| Test No. | Drop Height (m) | Test Mass (kg) | Temperature (°C) | Humidity (%RH) | Peak Deceleration (g) |
|----------|-----------------|----------------|------------------|----------------|-----------------------|
| 1        | 2.0             | 101Kg          | 19.2             | 51.1           | 10.92                 |
| 2        | 2.0             | 101Kg          | 19.2             | 51.1           | 11.65                 |
| 3        | 2.0             | 101Kg          | 19.2             | 51.1           | 13.26                 |





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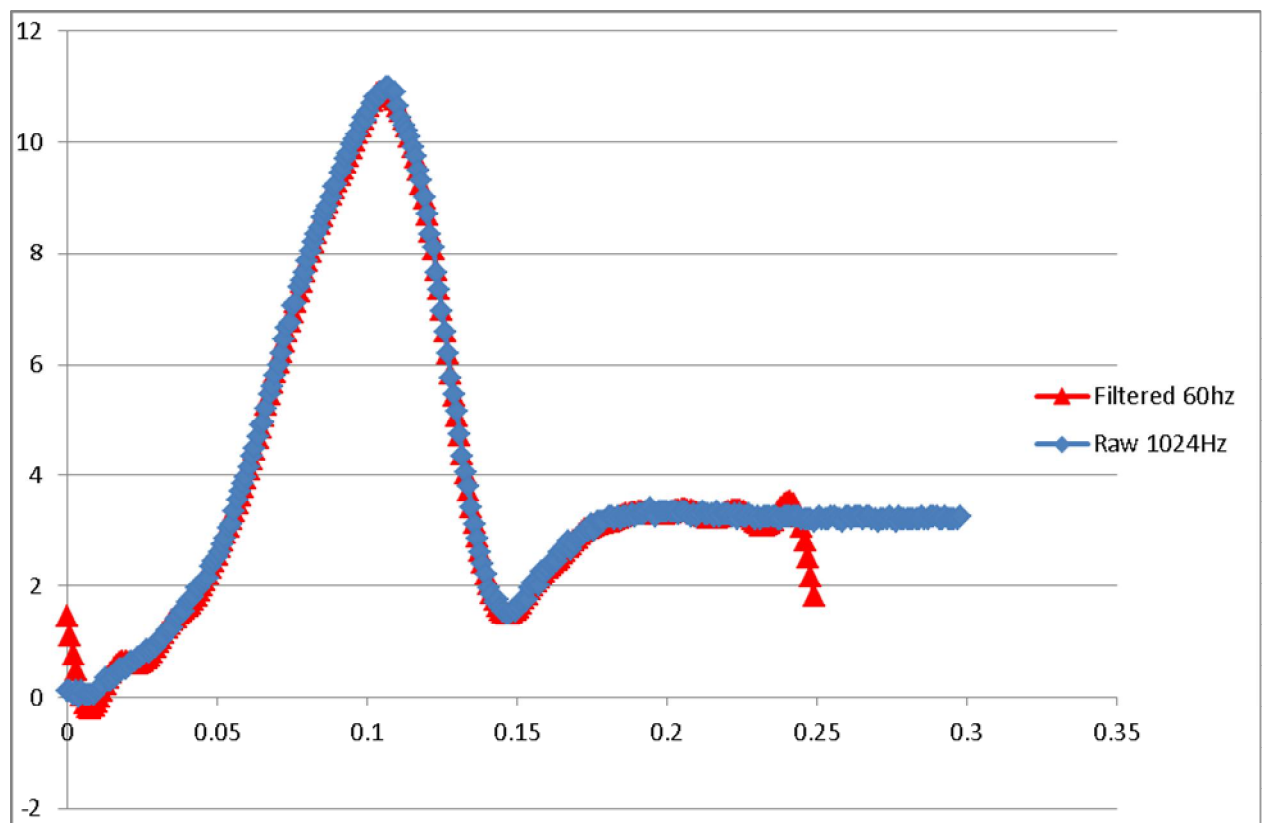
## 5 References

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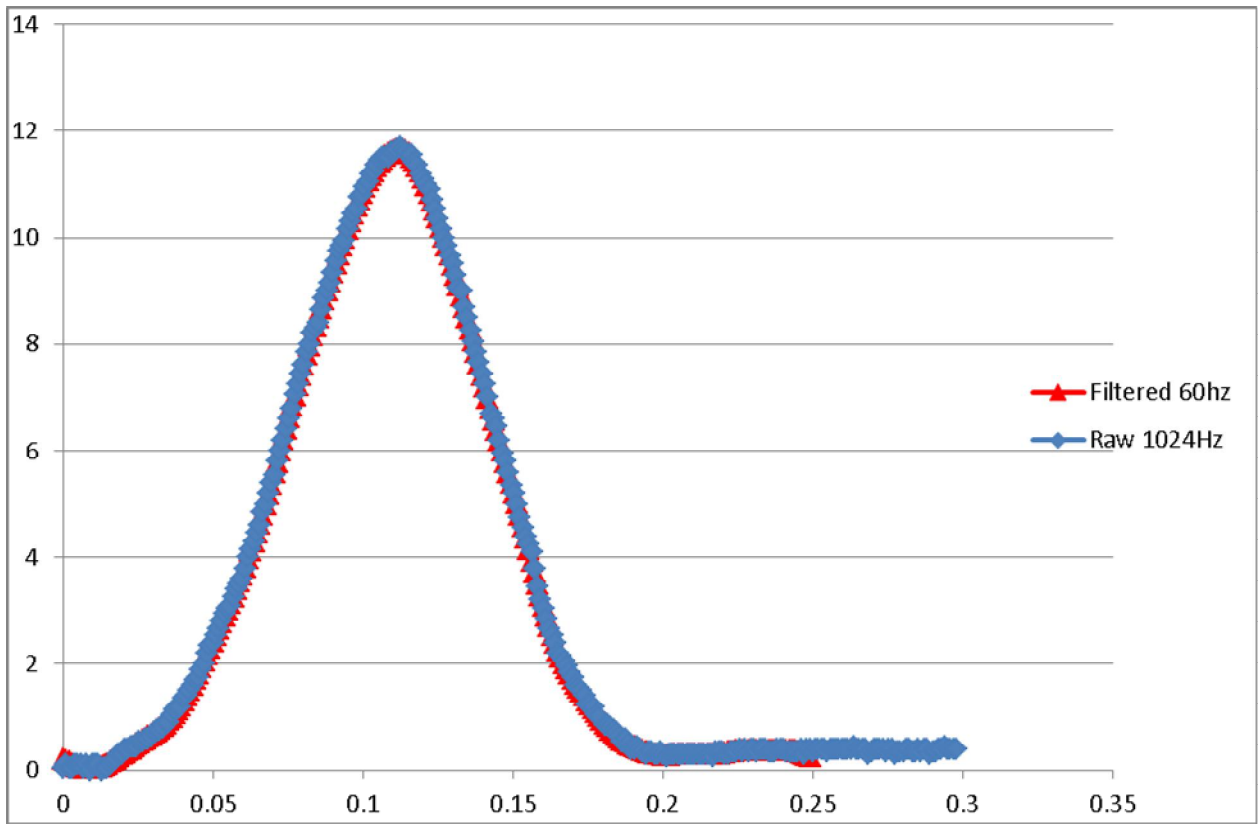
- 1) PAS 59:2014 incorporating corrigendum No 1 (January 2015), Specification for collective fall arrest soft landing systems, BSI.



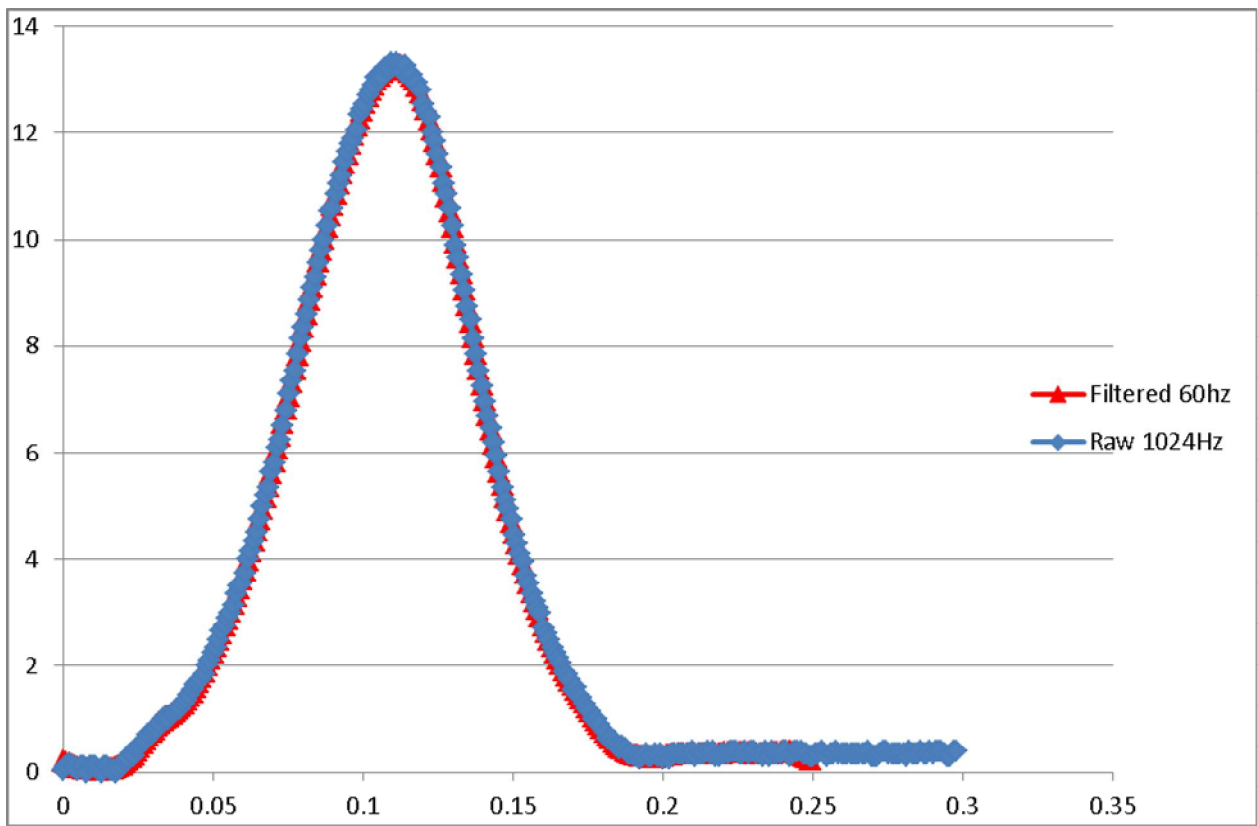
## Appendix A Measured time – deceleration plots



Test 1



Test 2



Test 3